

AQUA-LAB EVO™

CHEMICAL DISPENSING SYSTEM

User Manual

REV H



TABLE OF CONTENTS

CONTENTS

Principles of Operation	1
Specifications	1
AQUA-LAB EVO Components	2
Integrated Motor Starter Wiring Diagram	3
Installation	4
5 Easy Steps For Installation	4
Estimated Timeline	5
Pre-Installation	5
Installation	5
Post Installation	5
Total Hours Spent	5
Installation Instructions	5
Unpacking	6
Location & Mounting	6
Feed Water Connection	6
Pneumatic Connections	6
Startup	7
Pump Priming Instructions	7
Optimizing the System	8
Injectors vs. Metering tips vs. Nozzles	8
Application Optimization	8
Chemical Usage Measuring	8
Recommended Maintenance	9
Troubleshooting	9
Injector Vacuum Check (for troubleshooting injectors)	9
Injector Issues	10
Air Operated Valve Replacement	11
Pump Issues	11
Pressure Regulator Issues	12
Flow / Arch Issues	12
Valve Issues	12
Reference	13
Chemical Dilution Ratios	13
Chem-Flex Injector Part Numbers	14
Replacement Parts List	15
Warranty	16
Appendix A (Pre-Installation Checklist)	17
Appendix B (Optional OEM Instructions)	18-20

PRINCIPLES OF OPERATION

The Aqua-Lab EVO was designed to meet the application requirements of the standard roll-over automatic car wash with an available pump room to store chemical and equipment.

The system is set-up so that all that is required from the car wash controller is an output signal for each valve. The EVO electrical control box uses that signal to open both the 3.5 watt air solenoid valves and to start the pump.

With a 40 psi or greater city water pressure feed, the standard 10 GPM pump produces up to 225 psi of pressure which is regulated down to 200 psi by the bypass regulator. (The pump should never run above 225 psi.)

The 200 psi water flows into the Hydra-Cannon manifold, which is fitted with up to 12 air-actuated valves that are controlled by air solenoid valves. The water valves control the flow of water to each injector or flow-thru rinse fitting.

The Chem-Flex injectors are color-coded based on the water flow needed for each individual application, and combine with color-coded chemical metering tips to proportion the precise chemical mix ratio. As water flows into the Chem-Flex injector, the velocity increases. As the velocity increases the pressure decreases creating a vacuum which allows the precise amount of chemical to be pulled into the chamber where it mixes with water. This precise chemical mixing, along with the proper nozzle, creates an optimal display in the wash bay.

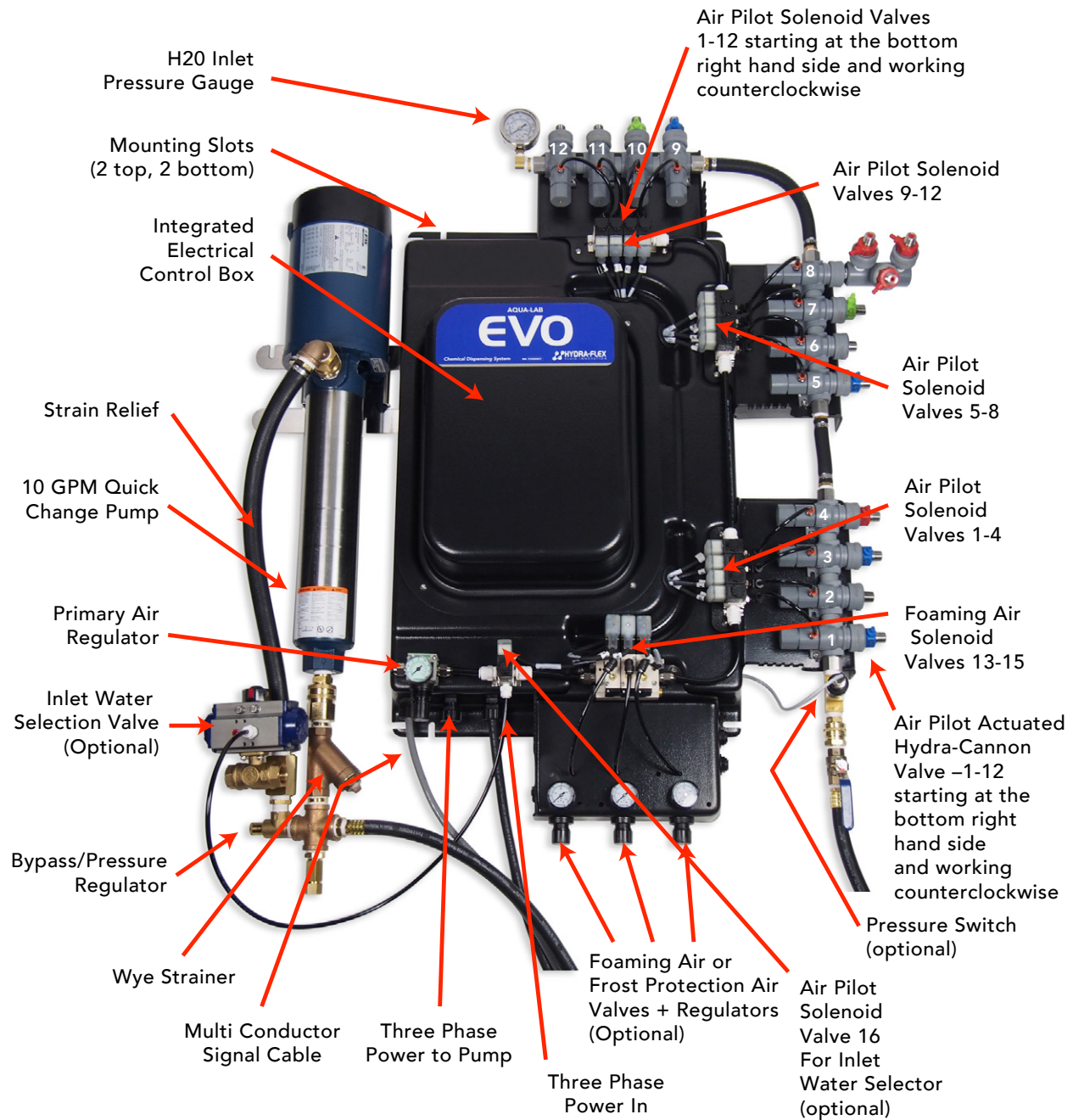
Optional components include an inlet water selection valve, a foaming air wing, a system-protection pressure switch and a tri-foam manifold.

- The inlet water selection valve is operated using an air solenoid valve. This valve allows the option of using two different water sources.
- The foaming air wing can be used for foaming air or as a blow-out frost protection. When the temperature drops below a certain pre-set point, the car wash controller opens the air valve causing air to be forced through the lines, clearing them of water or solution that could potentially freeze and cause damage.
- The pressure switch is supplied to ensure that if the pump is not getting pressure, a signal will be sent to the controller to shut the system down.
- The tri-foam manifold is a three position quick-connect manifold that fits into a single port to support triple foam or equivalent operations.

SPECIFICATIONS

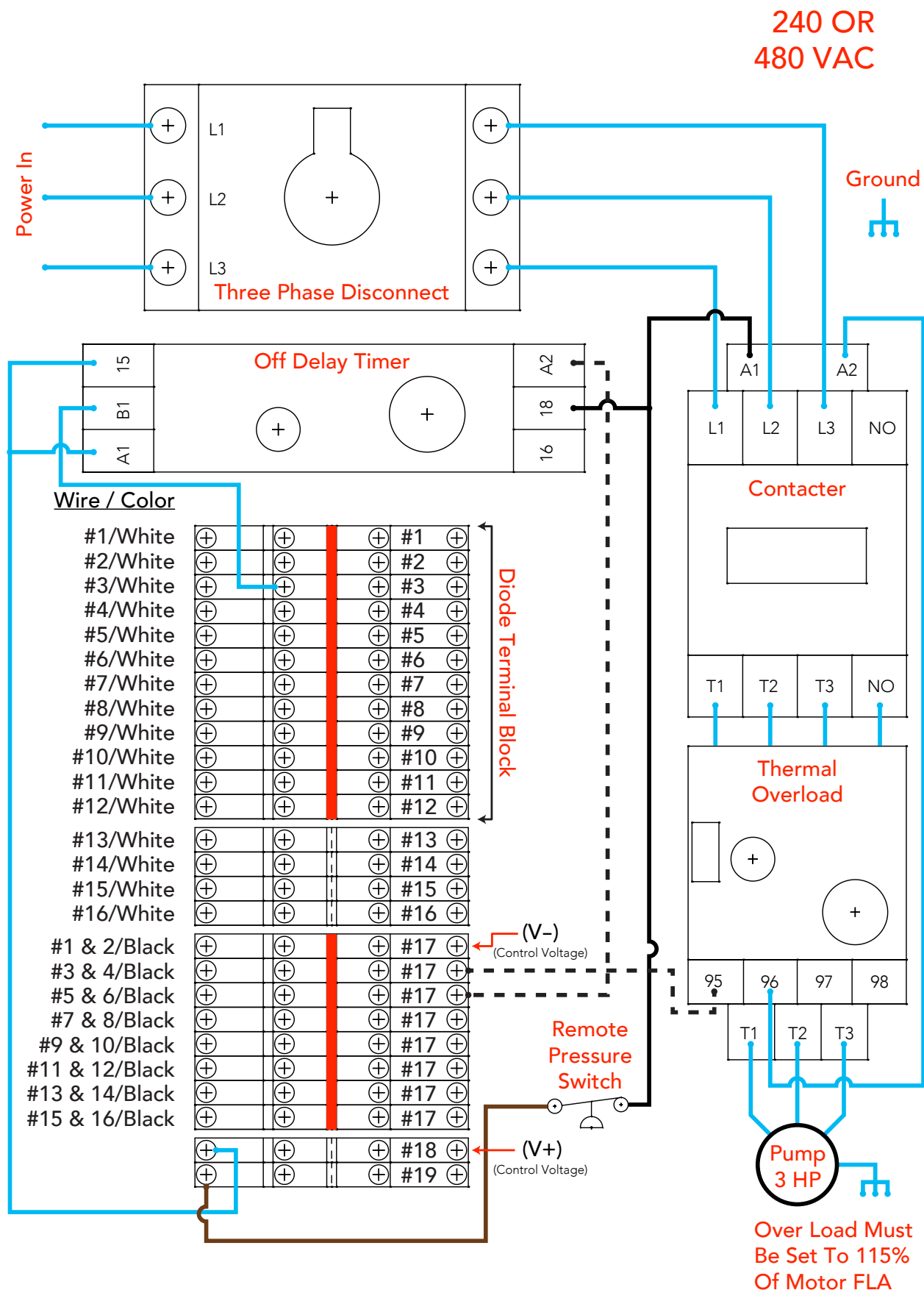
SYSTEM REQUIREMENTS			
Power requirements	10 GPM pump		Air-actuated valves
	208-230V/3HP/8A or 460V/3HP/4A		24VDC, 24VDC or 120VAC 3.5 watts per port
Space requirements	38" W x 44" H with pump assembly		
Water inlet line	3/4" ID		
Pneumatics operating pressure	80 - 100 PSI - Do not operate valves above 100 PSI		
Operating ambient temperature	40 - 120° F		
Solution outlet	Up to 3.25 GPM	3.25 GPM - 5.5 GPM	5.5 GPM - 8 GPM
	3/8" ID (1/2" polyflow)	1/2" ID	5/8" ID
Operating water pressure	200 PSI factory set (Assuming 40 PSI city feed), 180 PSI if tank fed		
Max. water source temperature	140° F (+60° C)		
Air inlet line	3/8" OD polyflow		
Air outlet line	3/8" OD polyflow per application		
Air inlet pressure	20 CFM @ 80 - 100 PSI dry air		

AQUA-LAB EVO™ COMPONENTS



See Appendix B (Optional OEM Instructions) pg.19

INTEGRATED MOTOR STARTER WIRING DIAGRAM



HFI TERMINAL POSITION	WIRE NUMBER
AIR ACTUATED HYDRA-CANNON VALVE-1	WIRE #1
AIR ACTUATED HYDRA-CANNON VALVE-2	WIRE #2
AIR ACTUATED HYDRA-CANNON VALVE-3	WIRE #3
AIR ACTUATED HYDRA-CANNON VALVE-4	WIRE #4
AIR ACTUATED HYDRA-CANNON VALVE-5	WIRE #5
AIR ACTUATED HYDRA-CANNON VALVE-6	WIRE #6
AIR ACTUATED HYDRA-CANNON VALVE-7	WIRE #7
AIR ACTUATED HYDRA-CANNON VALVE-8	WIRE #8
AIR ACTUATED HYDRA-CANNON VALVE-9	WIRE #9
AIR ACTUATED HYDRA-CANNON VALVE-10	WIRE #10
AIR ACTUATED HYDRA-CANNON VALVE-11	WIRE #11
AIR ACTUATED HYDRA-CANNON VALVE-12	WIRE #12

FOAMING AIR VALVE-13	WIRE #13
FOAMING AIR VALVE-14	WIRE #14
FOAMING AIR VALVE-15	WIRE #15

INLET SELECTOR-16	WIRE #16
COMMON-17	WIRE #17
+ CONTROL VOLTAGE-18	WIRE #18
LOW WATER FAULT-19	WIRE #19

INSTALLATION

5 EASY STEPS FOR INSTALLATION

COMPLETE PRE-INSTALLATION CHECKLIST BEFORE THESE STEPS (Appendix A pg. 17)

1. Unpack
2. Hang the equipment
3. Make connections
4. Start-up
5. Optimizing the system (see pg.8)

ESTIMATED TIMELINE

PRE-INSTALLATION

WHO	TASK	EST. TIME
DISTRIBUTOR & CUSTOMER	DETERMINE LOCATION TO INSTALL EQUIPMENT	1/4 HR
PLUMBER	INSTALL WATER SUPPLY LINE	1 HR
ELECTRICIAN	INSTALL ELECTRICAL SUPPLY LINE	1 HR
TECHNICIAN	LABEL ALL CONTROLLER RELAYS AT CONTROLLER	1/4 HR
TECHNICIAN	RUN SOLUTION AND AIR LINES (IF NECESSARY)	1 HR
TECHNICIAN	INSTALL AIR SUPPLY LINE	1 HR
	TOTAL LABOR HOURS	4 1/2 HRS

INSTALLATION

WHO	TASK	EST. TIME
DISTRIBUTOR / TECHNICIAN	HANG EQUIPMENT	1 HR
TECHNICIAN	CONNECT WATER, AIR AND SOLUTION LINES	1/2 HR
TECHNICIAN	CONNECT CONTROL LEADS TO MAIN CONTROLLER OR JUNCTION BOX	1 HR
DISTRIBUTOR/TECHNICIAN	STARTUP (INJECTOR, METERING TIP AND NOZZLE SELECTION)	1/2 HR
DISTRIBUTOR/TECHNICIAN	DOCUMENT CONFIGURATION	1/2 HR
	TOTAL LABOR HOURS	3 1/2 HRS

POST INSTALLATION

WHO	TASK	EST. TIME
DISTRIBUTOR	MONITOR & RECORD PERFORMANCE	1 HR / WK
DISTRIBUTOR	MAINTENANCE PER SCHEDULE OR AS NEEDED	

TOTAL HOURS SPENT

TOTAL CUSTOMER	1/4 HR
TOTAL DISTRIBUTOR/TECHNICIAN	6 HR
TOTAL ELECTRICIAN	1 HR
TOTAL PLUMBER	1 HR

Installation takes approximately ONE day. An electrician and a plumber are needed for half a day.

INSTALLATION INSTRUCTIONS

General Skill Level

- Mechanical: Basic - mounting equipment.
- Electrical: Advanced - three phase power and controls knowledge (local codes knowledge required).
- Plumbing: Moderate – principal supply line required.

- Pneumatic: Basic- pneumatic utility connection required.
- Chemical Knowledge: Moderate - chemical titrations required.

Tools & Equipment Needed

- | | | | |
|----------------------------|----------------|-----------------|---------------------|
| • Drill with Phillips head | • Hammer | • Utility knife | • Adjustable wrench |
| • Concrete drill bit 3/8" | • Tape measure | • Wire stripper | • Screw driver set |
| • Concrete drill bit 5/32" | • Level | • Socket set | • Teflon tape |

UNPACKING

The AQUA-LAB EVO is shipped in a wooden crate for protection.

1. Cut straps holding boxes onto pallet.
2. Lift the pump from the pallet. Use assistance if necessary.
3. *****Be sure not to discard the manuals and accessories box.**

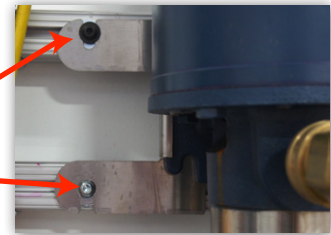
LOCATION & MOUNTING

**If location was not identified during the Pre-Installation Process, make sure to consider the proximity to feed water, power supply, and the control cabinet as well as space near the system to store chemical containers.

*****See drawing in reference for general layout (in appendix A)**

Pump Assembly - Need To Be Mounted On Left Side Of Aqua-Lab Evo Panel

1. Drill (4x) 3/8" holes in wall for pump mounting bracket.
2. Insert concrete anchors, set pump mounting bracket on bolts & tighten down.
3. Slide pump onto stand.



AQUA-LAB EVO

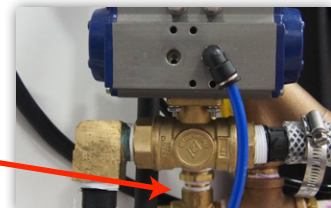
1. Drill (4) 5/32" holes on the wall. 19 1/4" wide, 33" tall.
2. Press EVO board tight against the wall.
3. Screw in 3/16" concrete screws with a washer (not included).



FEED WATER CONNECTION

****Prior To Connection, Ensure That The Feed Lines Are Free Of Debris By Flushing Out The Lines For 15 Minutes.**

- Connect pre-run main water supply line to pump inlet 3/4" NPT female connection.



PNEUMATIC CONNECTIONS

- Connect pre-run 3/8" OD poly air feed line to push connect fitting on the inlet side of the primary regulator.
- Connect 3/8" OD poly lines from EVO to foam generator(s).

**If there are unused air ports, back out the individual line regulator until air no longer flows.



START UP

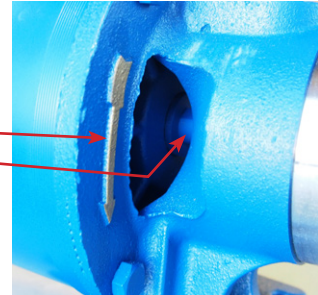
!WARNING!

PUMP MUST BE PRIMED BEFORE OPERATION.

PUMP PRIMING INSTRUCTIONS

(ASSUMES > 40 PSI CITY FEED TO PUMP)

1. Pull the pump outlet line at the manifold quick-connect. Open ball valve and direct toward a drain or container to remove the majority of the air from the pump until a steady stream of water is flowing (approx. 1 min).
2. Start the pump for a short period of time. **ENSURE THAT PUMP ROTATION IS CORRECT** as indicated by the arrow on the bottom of the pump and that 200 psi can be reached.
 - If pump cannot regulate to 200 psi, look at flat spot on the shaft or remove pump motor cover and look at shaft to confirm correct rotation.
3. Start the pump and slowly open ball valve until it is wide open. Allow to run for 60 seconds to flush lines and then close valve.
4. Reconnect the high pressure line to the Hydra-Cannon Manifold and open valve.
5. Confirm that the pump can obtain 200 psi (180 psi for tank fed) while firing solenoids and that the pump housing (stainless steel tube) is cool to the touch after a minute in operation.
 - If housing is hot or noisy, pump did not prime correctly.
 - It is normal for external housing of the motor to exceed 150° F.
6. If pump does not prime, repeat steps 3-5.
7. Verify pump prime 24 hours after operation to ensure prime held. Pay close attention to the temperature of the pump housing (stainless steel area). If it starts getting hotter than the supply water or greater than 140° F, then it is likely that the pump did not prime correctly which **WILL CAUSE DAMAGE** to pumps. The motor housing (painted portion) will be hot during operation.

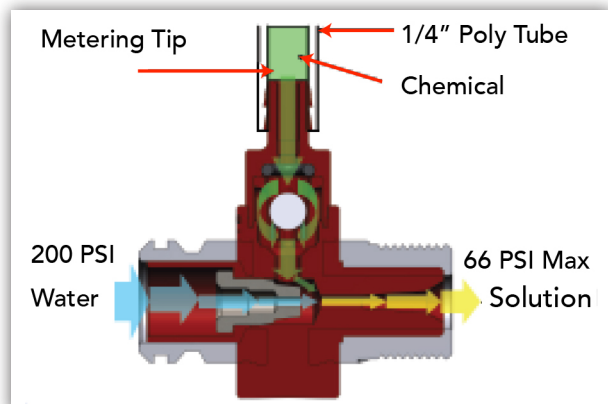


OPTIMIZING THE SYSTEM

CONSISTENTLY ACHIEVE THE DESIRED CLEANING AND PRESENTATION/ PERFORMANCE USING THE LEAST AMOUNT OF CHEMICAL AND WATER

INJECTORS VS. METERING TIPS VS. NOZZLES

THE KEY TO OPTIMIZING THE SYSTEM IS THROUGH TRIAL AND ERROR. DON'T BE AFRAID TO TRY THESE STEPS TO ACHIEVE YOUR IDEAL PERFORMANCE.



What do injectors do?

- Injectors increases or decreases the amount of water in the solution

What do metering tips do?

- Metering tips increases or decreases the amount of chemical in the solution

What do nozzles do?

- Nozzles determine the pattern and back pressure of the solution

APPLICATION OPTIMIZATION

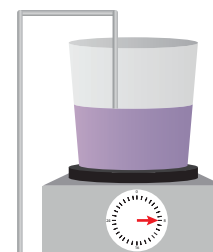
(REPEAT FOR EACH APPLICATION)

- **Application too wet**
 - Increase air
 - Reduce injector size (decreases water)
 - Increase metering tip (increases chemical)
- **Application too dry**
 - Decrease air
 - Increase injector size (increases water)
 - Decrease metering tip (decreases chemical)
- **Nozzle sputters**
 - Decrease air
 - Decrease nozzle(s) and/or size used on arch
 - Increase injector size (increases water)
- **Too much chemical used**
 - Decrease metering tip
 - Decrease metering tip and injector size (to maintain desired ratio)
- **No chemical**
 - Check vacuum of injector (see instructions on page 9)
 - Check foot valve
 - Check metering tip
- **Nozzle fan pattern not filled**
 - Reduce nozzle size
 - Increase injector size (increases water)
- **Water not present at all nozzles on arch**
 - Verify check valves are functioning
 - Verify nozzles are not plugged
 - Reduce number of nozzles
 - Reduce nozzle size
 - Increase injector size (increases water)

CHEMICAL USAGE MEASURING

VERIFY TITRATION OF CHEMICALS BEFORE PROCEEDING

1. Set up lab scale with small bucket of chemical to be measured. →
2. Put the suction line into the bucket.
3. Run the application being tested to "prime" the line. (All air bubbles must be removed for accuracy.)
4. Record the **Initial Weight** from the scale. (Tarring the scale with weight on the scale can affect accuracy.)
5. Run the application for 6 vehicles (or manually for the same amount of time it would be on for 6 vehicles).
6. Record the **Final Weight** from the scale.
7. Subtract the Initial Weight from the Final Weight to determine the weight of used product.
8. Divide this **Used Weight** by 6 to get a per car weight.
9. Divide the **Per Car Weight** in grams by the specific gravity of the chemical to determine the milliliters of chemical used per vehicle.
10. Repeat for each chemical application.



RECOMMENDED MAINTENANCE

THE RECOMMENDED SERVICE AND MAINTENANCE ON THE AQUA-LAB SYSTEM ARE AS FOLLOWS.

Monthly

- Check air regulator.
- Check water filter and replace as needed (if installed).

Semi-Annually

- Check and replace injector metering tips.
- Check and clean wye strainer.
- Inspect and replace chemical lines as needed.
- Ensure chemical draw lines are tightly secured to injector hose barbs. Chemical draw lines loosen overtime which can cause deviation in chemical usage; clip 1" off old hose as needed that was stretched by hose barb.

Annually

- Clean water regulator.
- Inspect motor starter for corrosion, if identified order replacement/spare parts.

1-3 Years

- Inspect and replace injectors.
- Replace water valves.
- Replace main water pressure regulator.

TROUBLESHOOTING

INJECTOR VACUUM CHECK

(FOR TROUBLESHOOTING INJECTORS)

1. At the Chem-Flex injector, remove the chemical feed line from the injector hose barb.
2. Attach the tubing of the vacuum gauge to the Chem-Flex hose barb (Image A).
3. With the pump(s) on, manually activate the chemical that is to be tested at the main car wash control cabinet. An injector that is working properly will have a reading greater than or equal to (\geq) 20 in Hg
4. If vacuum reads <20 in/Hg (image B), remove solution metering tip (image C) and retest.
 - a. If retest vacuum reads >20 in/Hg (image D), The solution metering tip is clogged. Replace the metering tip.
 - b. If Retest vacuum reads <20 in/Hg, continue to STEP 5
5. Remove a nozzle on the arch or the chemical feed line from the foam generator and retest vacuum.
 - a. If retest vacuum reads >20 in/Hg, back pressure is being created. Continue to STEP 6.
 - b. If back pressure is not still not being created try these steps and retest after each:
 1. Clean nozzle tips.
 2. Loosely replace media in foam generator. Do no over pack.

A



B



C



3. Decrease air pressure for foaming.

4. Try smaller injector (this will produce less flow and thus less back pressure).

c. If retest vacuum reads <20 in/Hg, replace injector and retest. If vacuum continues to read <20 in/Hg, call your service provider.

D



6. Repeat steps 2-5 for each chemical lane that a vacuum reading is needed for.

7. Once testing is complete, turn off the AQUA-LAB pump from the main car wash control cabinet.

There is a variation of performance in the injectors that comes from slight variations in the dimensions of the parts and in assembly that are unavoidable. It is common to see the resultant vacuum range from 20 in Hg all the way up to 28. There is also variation in the through hole size on the meter tips from Dema (within their manufacturing tolerances). Using the same tip color from site to site is a good starting point. However with the potential for variation from part to part it is reasonable to still need to do some adjustments from there.

INJECTOR ISSUES

PROBLEM	POTENTIAL CAUSES	SOLUTIONS
Injector is not drawing chemical - PASSES vacuum pressure check	Clogged chemical feed	Check chemical hose, foot valve, metering tip and hose barb for debris or clogs.
Injector is not drawing chemical - FAILS vacuum pressure check	Too much back pressure on injector	Clean or replace downstream check valves, increase nozzle size or quantity, use larger tubing, or use smaller flow injectors.
	Clogged injector check valve	Blow compressed air through the chemical hose barb on the injector to remove debris.
	Clogged injector nozzle	Remove injector and blow out any debris with compressed air.
	Defective injector	Replace injector.
	Product specific - Sonny's Rain Bar	Remove elbow at inlet to foam generator and remove nozzle.
	Manifold inlet clogged (rare)	Remove end fittings and retention rod. Clean out inlet holes to allow full flow.
No flow from injector	Valve malfunction, valve not opening	Ensure minimum 60 psi on primary air regulator, ensure valve receiving signal.
	Clogged injector	Remove injector and blow out debris with compressed air.
	No water supply	Check that the system has a supply of water.
Injector stainless steel disintegrating	Strong Acid	Call Hydra-Flex and order composite version of injectors.

AIR OPERATED VALVE REPLACEMENT

(PN: 3000931)

1. Shut off the ball valve to Hydra-Cannon manifold.
2. Disconnect air line from front of valve.
3. Unscrew quick connect fitting by hand (**DON'T LOSE BLACK WASHER**).
4. Unscrew valve assembly from the Hydra-Cannon manifold.
5. Screw new valve into manifold until hand tight and threaded pilot port is facing forward.
6. Remove the cap from pilot port and thread in quick connect fitting to front of valve – **Hand Tight ONLY**.
7. Push air line back into fitting.
8. Open the ball valve to the Hydra-Cannon manifold.

Unscrew from manifold using this portion of valve



PUMP ISSUES

PROBLEM	POTENTIAL CAUSES	SOLUTIONS
Pump Operates, But Only Delivering 100-150 Psi	Incorrect motor rotation	Reverse rotation by interchanging two power leads in motor starter box.
Pump Operates, But Delivers Little Or No Water	Pump not priming	See priming instructions.
	Missing 1 of 3 phases	Wire according to diagram.
	Inadequate water supply	Check pressure on inlet side of pump to be sure positive pressure is maintained.
	Undersized piping	Replace with larger piping.
	Leak on the inlet side	Make sure connections are tight.
	Worn or defective pump parts	Replace worn parts or entire pump, clean parts if required.
Pump Will Not Start Or Run At Full Speed	Constant hot not connected	Make sure constant control voltage is supplied in car wash controller.
	Blown fuse or circuit breaker	Could be due to blown pump motor. Try to turn breaker back on or replace fuse. If breaker trips after trying to fire the motor is most likely burned out. Replace with new motor and pump.
	Defective motor starter contactor	Replace motor starter contactor.
	Thermal overload set too low	Adjust setting on thermal overload to match voltage.
	Incorrect motor voltage	Voltage must be within 10% of motor rated voltage.
	Defective motor	Replace motor.
	E-Stop is depressed	Unlock E-stop.
	Pump components damaged	Replace worn part or entire pump.
	Not primed	Re-prime pump.

PROBLEM	POTENTIAL CAUSES	SOLUTIONS
Excessive Noise From Pump	Pump not secured firmly	Secure properly.
	Restricted inlet	Clean or correct restriction.
	Water regulator fluttering / chattering	Adjust regulator down and then back up or replace regulator.
	Cavitation (sounds like marbles in pump)	Increase inlet size.
	Worn mechanical seal	Replace pump.
Pump Leaks	Loose fittings, and or not enough thread tape	Tighten fittings, and or take part off and put new thread tape on.

PRESSURE REGULATOR ISSUES

PROBLEM	POTENTIAL CAUSES	SOLUTIONS
System Won't Regulate Up To 200 Psi	Pump not primed	Follow priming instructions.
	Debris in regulator	Remove regulator and clean out debris.
	Motor rotation incorrect	Verify rotation.
	Opening too many valves at once	System is limited by size of pump and size of injectors, increase flow by adding secondary pumps or reduce size / number of injectors open.
	Defective check valve (if applicable)	Replace check valve.
	Defective Regulator	Replace regulator.
	Defective Pump	Replace Pump.

FLOW / ARCH ISSUES

PROBLEM	POTENTIAL CAUSES	SOLUTIONS
Flow At Arch Is Too Low	Incorrect injector flow rate selection	Replace with larger injector.
	System pressure too low	Ensure system pressure is set at 200psi.
	Foam generator plugged	Ensure cleaned and clear.
	Downstream plumbing restrictive	Increase size of plumbing / tubing, ensure check valves are cleaned or new, reduce elbows in line or other turns that would restrict.








VALVE ISSUES

PROBLEM	POTENTIAL CAUSES	SOLUTIONS
Valve Will Not Open	Air pressure too low	Ensure primary air regulator reading at least 60 psi, turn up to 80-90psi if possible and check again.
	System pressure too low	Remove valve from manifold, Carefully remove top of valve (caution – under high spring pressure) push white piston up with small allen wrench from opposite end and check o-ring condition. Replace and lubricate if needed.
Valve Leaks Air Or Water Out Top	Internal o-ring seal damaged / worn	Remove valve from manifold, Carefully remove top of valve (caution – under high spring pressure) push white piston up with small screwdriver from opposite end and check o-ring condition. Replace with 018 Viton O-ring and lubricate with Dow 111 valve lube.
Valve Remains Open After Signal Is Off	Manifold pressure is above 230 psi	Reduce pressure to manifold to 200 psi operating pressure.

REFERENCE

CHEMICAL DILUTION RATIOS

























(Assumes feed pressure of 200 PSI)

		#8-32 METERING TIPS								
Flow Rate (GPM) at 200 PSI		0.25	0.50	0.75	1.00	1.50	2.00	2.25	3.25	5.50
Injector Color →		White	Yellow	Tan	Red	Orange	Gray	Blue	Light Green	Dark Green
Nozzle Size →		0.029" (0.7 mm)	0.040" (1.0 mm)	0.051" (1.3 mm)	0.057" (1.4 mm)	0.070" (1.8 mm)	0.083" (2.1 mm)	0.086" (2.2 mm)	0.098" (2.5 mm)	0.125" (3.2 mm)
Metering Tip	COPPER 	1: 57	1: 104	1: 155	1: 195	1: 281	1: 406	1: 468	1: 629	1: 1074
	PUMPKIN 	1: 43	1: 82	1: 119	1: 126	1: 238	1: 348	1: 398	1: 554	1: 946
	BURGUNDY 	1: 34	1: 67	1: 97	1: 111	1: 207	1: 304	1: 347	1: 495	1: 845
	LIME 	1: 28	1: 57	1: 81	1: 100	1: 183	1: 270	1: 307	1: 447	1: 764
	TAN 	1: 28	1: 57	1: 81	1: 100	1: 183	1: 270	1: 307	1: 447	1: 764
	ORANGE 	1: 23	1: 44	1: 64	1: 78	1: 137	1: 196	1: 215	1: 314	1: 536
	TURQUOISE 	1: 17	1: 31	1: 45	1: 55	1: 91	1: 126	1: 134	1: 197	1: 336
	PINK 	1: 14	1: 24	1: 35	1: 42	1: 68	1: 93	1: 98	1: 143	1: 224
	LIGHT BLUE 	1: 11	1: 17	1: 24	1: 31	1: 47	1: 64	1: 66	1: 98	1: 166
	BROWN 	1: 10	1: 15	1: 22	1: 28	1: 43	1: 58	1: 59	1: 88	1: 150
	RED 		1: 12	1: 17	1: 23	1: 34	1: 45	1: 46	1: 69	1: 116
	WHITE 		1: 12	1: 16	1: 22	1: 31	1: 42	1: 43	1: 64	1: 108
	GREEN 		1: 11	1: 14	1: 20	1: 28	1: 37	1: 38	1: 55	1: 94
	BLUE 		1: 10	1: 12	1: 17	1: 23	1: 30	1: 31	1: 46	1: 77
	YELLOW 			1: 9	1: 12	1: 16	1: 20	1: 22	1: 31	1: 52
	BLACK 				1: 10	1: 13	1: 16	1: 17	1: 24	1: 40
	PURPLE 				1: 6.6	1: 8.3	1: 9	1: 10	1: 13	1: 21
	GRAY 				1: 5.3	1: 6.7	1: 6.9	1: 7.6	1: 10	1: 16
	OPEN				1: 4.9	1: 5.3	1: 5.2	1: 6.0	1: 6.1	1: 10

		SPIRAL METERING PLUGS								
Flow Rate (GPM) at 200 PSI		0.25	0.50	0.75	1.00	1.50	2.00	2.25	3.25	5.50
Injector Color →		White	Yellow	Tan	Red	Orange	Gray	Blue	Light Green	Dark Green
Nozzle Size →		0.029″ (0.7 mm)	0.040″ (1.0 mm)	0.051″ (1.3 mm)	0.057″ (1.4 mm)	0.070″ (1.8 mm)	0.083″ (2.1 mm)	0.086″ (2.2 mm)	0.098″ (2.5 mm)	0.125″ (3.2 mm)
Spiral Plug Length	3.00″	1: 251	1: 503	1: 754	1: 1006	1: 1509	1: 2012	1: 2263	1: 3269	1: 5532
	2.00″	1: 181	1: 363	1: 544	1: 726	1: 1089	1: 1451	1: 1633	1: 2359	1: 3991
	1.00″	1: 104	1: 208	1: 311	1: 415	1: 623	1: 831	1: 934	1: 1350	1: 2284
	0.75″	1: 82	1: 165	1: 247	1: 329	1: 494	1: 659	1: 741	1: 1071	1: 1812
	0.50″	1: 59	1: 119	1: 178	1: 238	1: 357	1: 475	1: 535	1: 772	1: 1307
	0.25″	1: 34	1: 68	1: 102	1: 136	1: 204	1: 272	1: 306	1: 442	1: 748

NOTE: Dilution ratios given above are based on drawing water through the metering tips and are meant as a starting point for system configuration. Results are expected to vary when drawing chemicals due to differences in viscosity and temperature.

CHEM-FLEX INJECTOR PART NUMBERS

QUICK CONNECT INJECTORS - PC2 X 3/8" NPT CONNECTIONS (For exclusive use with Aqua-Lab™ Chemical Dispensing Systems)					
COLOR	FLOW ORIFICE	FLOW RATE @ 200 PSI	SINGLE BARB	DUAL BARB	TRIPLE BARB
WHITE	0.029	0.25 GPM	 618029	-	-
YELLOW	0.040	0.5 GPM	 618040	 629040	-
TAN	0.051	0.75 GPM	 618051	 629051	 639051
RED	0.057	1.0 GPM	 618057	 629057	 639057
ORANGE	0.070	1.5 GPM	 618070	 629070	 639070
GRAY	0.083	2.0 GPM	 618083	 629083	 639083
BLUE	0.086	2.25 GPM	 618086	 629086	 639086
LIGHT GREEN	0.098	3.25 GPM	 618098	 629098	 639098
DARK GREEN	0.125	5.5 GPM	 618125	 629125	 639125



Single Hose Barb:
For diluting one chemical with water.



Dual Hose Barb:
For diluting two chemicals with water. Ideal for adding a color or scent to your solution.



Triple Hose Barb:
For diluting three chemicals with water. Ideal for adding a color and scent to your solution or for on-site blending of chemistry.

SPECIFICATIONS:


Pressure Range: up to 1000 PSI Max. (69 Bar) Inlet, 333 PSI (23 Bar) Max. Outlet

Temperature Range: 33°F - 175°F (.5°C - 79°C)


Maximum Wrench Torque: 30 ft-lbs (41 N-m)

METERING TIPS:

Color-coded tips are used to control the amount of chemical that is mixed with the water and the strength of the chemical solution.



Threaded In, Standard
P/N 1000643
Pack includes tan, orange, turquoise, pink, light blue, brown, red, white, green, blue, yellow, black, purple, and grey tips.

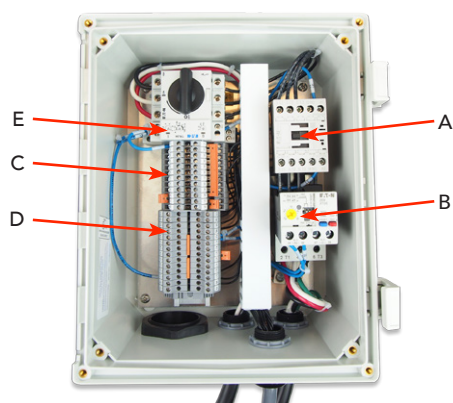
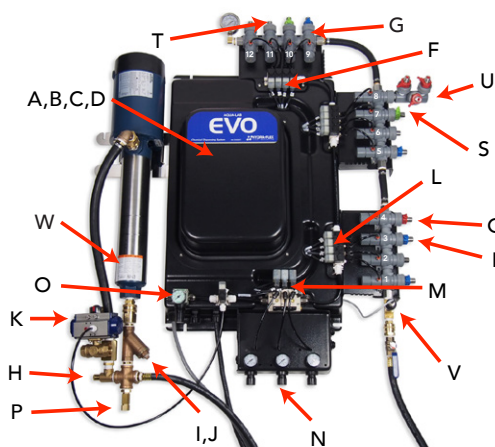


Threaded In, Ultra Lean
P/N 3000470
Pack includes copper, pumpkin, burgundy, and lime tips.



Spiral Plugs
P/N 1001290
Meters even greater ratios than ultra lean tips. Pack includes (10) spiral plugs, to be inserted into flexible vinyl chemical tubing, just prior to the injector. Dilution ratios are determined by plug length.

REPLACEMENT PARTS LIST - AQUA-LAB EVO™



	PART NAME	PART NUMBER
A	Contactor	24 VAC - 3001336
		24 VDC - 3001337
		120 VAC - 3001338
B	Thermal Overload	3001335
C	Diode Terminal Block	3001200
D	Terminal Block	3000338
E	Timer Relay	3000664
F	Din I x Field Wireable Cable - With LED	24 VAC/VDC - 3001157
		120 VAC 3001156
G	Air Actuated Hydra-Cannon Valve Replacement Kit - Composite	3000931
H	20 GPM Bypass Pressure Regulator - Brass	3000915
I	Wye Strainer	3000668
J	3/4" NPT T16 Wye Strainer Screen & Gasket Kit	1001936
	3/4" NPT T15 Wye Strainer Screen & Gasket Kit	1001937
K	Inlet Ball Valve	3001165
L	Solenoid Actuated Air Valve - Non Foaming	24VAC - 3001152
		24 VDC - 3001153
		120 VAC - 3001154
M	Solenoid Actuated Air Valve - Foaming	24 VAC - 1001428
		24 VDC - 1001429
		120 VAC - 1001430
N	Foaming Small Air Regulator & 0-60 PSI Gauge	3000808
O	Primary Air Regulator	3001160
P	Thermal Relief Valve - 1/2" NPT	3000323
Not Shown	1/4" Hose Barb Foaming Air Check Valve	3000819
Not Shown	Tan Injector - .75 GPM	618051
Q	Red Injector - 1.0 GPM	618057
Not Shown	Orange Injector - 1.5 GPM	618070
R	Blue Injector - 2.25 GPM	618086
S	Green Injector - 3.25 GPM	618098
T	Flow-Thru Adapter	3000173
Not Shown	Duo-Foam Manifold (Injectors Not Included)	1001232
U	Tri-Foam Manifold (Injectors Not Included)	1001087
Not Shown	O-Ring Replacement Kit	1001155
V	Low Water Fault Kit	3001205
W	10 GPM Pump	3001159

See Appendix B (Optional OEM Instructions) pg.20

AQUA-LAB EVO™ WARRANTY

FACTORY LIMITED

Hydra-Flex, Inc warrants its equipment to be free from defect in material or workmanship under proper normal use for a period of one (1) year beginning the date of purchase.

Hydra-Flex, Inc's liability shall be limited to repair or replacement of parts found to be defective within the warranty period and following Hydra-Flex, Inc's inspection. Hydra-Flex, Inc shall have the option requiring the return of defective material to establish the purchaser's claim. In the event of repair or replacement this limited warranty is non-cumulative. Neither labor nor transportation charges are included in this warranty.

This warranty is based upon the proper care and maintenance of the warranted equipment. Warranty does not apply if the merchandise is altered or modified in any way. Warranty does not apply to any equipment which has been subject to misuse, inappropriate use of tools, including exposure to harsh chemicals, neglect, lack of maintenance, freezing, fluid hammer, accident, third party damage, fluid impurities such as sand or minerals, acts of God or acts of war. Nor does it apply to any equipment which has been repaired or altered by anyone not so authorized by Hydra-Flex, Inc. All equipment must be properly installed in accordance with specified plumbing, electrical, and mechanical requirements. The warranty does not apply to normal wear and tear or routine maintenance components as described in the equipment manual.

Except as expressly stated herein, Hydra-Flex, Inc shall not be liable for damages of any kind in connection with the purchase, maintenance, or use of this equipment including loss of profits and all claims for consequential damages. This limited warranty is in lieu of all other warranties expressed or implied. Hydra-Flex, Inc neither assumes nor authorizes any person to assume for it any other obligation or liability in connection herewith. This warranty is neither assignable nor transferable.

Transportation damage claims are to be submitted to the carrier of the damaged material.



680 East Travelers Trail • Burnsville, MN 55337

T: 952-808-3640 • F: 952-808-3650 • www.hydraflexinc.com • info@hydraflexinc.com

APPENDIX A

AQUA-LAB EVO PRE-INSTALLATION CHECKLIST

- ☐ **STEP 1:** Determine who will be involved in installation

WHO	NAME	PHONE
Distributor / Technician:		
Chem. Supplier:		
Car wash Owner:		
Site Manager:		
Electrician:		
Plumber:		
Other:		

- ☐ **STEP 2:** Determine Aqua-Lab location
- EVO – 38" wide x 44" high
 - Pump – 8" wide x 4' high
- ☐ **STEP 3:** Electrician to provide breaker and line run to the location where the motor starter will be mounted per local code.
- 15 amp Breaker per Operating Pump
- ☐ **STEP 4:** Run water supply line to location
- Single Pump – 3/4" Supply Line
- ☐ **STEP 5:** Locate main car wash control panel. Identify and label all relays.
- ☐ **STEP 6:** Locate main compressed air line and drop a 3/8" feed to the location of the AQUA LAB.
- ☐ **STEP 7:** Run new 1/2" poly lines for solution from the gantry to the location of the AQUA LAB EVO.
- Carefully label each line for the application and chemical.
- ☐ **STEP 8:** Run new 3/8" poly lines for air from the gantry to the location of the AQUA LAB EVO.
- ☐ **STEP 9:** Confirm delivery of AQUA LAB EVO with HFI
- ☐ **STEP 10:** Coordinate Install date with all parties involved

Delivery Date: _____

Install Date: _____

GENERAL LAYOUT

